HOOVER HYDROCARBON EMISSIONS REPORT

CONTENTS

H. W. Emrick
March 23, 1977

Date Report Submitted: March 23, 1977

ENVIRONMENTAL PROTECTION AGENCY
AIR POLLUTANT EMISSIONS REPORT
SECTION I - GENERAL INFORMATION

FORM APPROVED
OMB NUMBER 158-R75

For Official Use Only:
Date Sent:
Date Returned:
UTM Grid Coordinates:
SIC No.:
Source ID:

Plant, institution, or establishment name: Hoover Company - Main Plant

Plant, institution, or establishment address: 101 East Maple St. (Street or Box Number) North Canton (City) Ohio (State) 44720 (Zip)

Person to contact regarding this report: H. W. Emrick Title: Env. Control Mgr. Telephone: (216) 499-9200

Mailing address: 101 East Maple St. (Street or Box Number) North Canton (City) Ohio (State) 44720 (Zip)

~~Approximate number of employees at plant, institution, or establishment location: ☐ Less than 100 ☐ 100 or more.~~

~~Elevation of plant, institution, or establishment in relationship to mean sea level: _____ feet above mean sea level, _____ feet below mean sea level.~~

Information is representative of calendar year: 1976.

Land area at plant location: _____ acres. Enclose a sketch of layout if there is more than one building.

Plant location: (give nearest cross streets, describe by landmarks or enclose a map, engineering drawing, or sketch) East Maple St. and Main St., North Canton, Ohio (See Exhibit A)

☐ Air pollutants of the type indicated in the instructions for the completion of this report, i.e., _____ are not emitted at this plant, institution or establishment. Therefore, no other Sections of the report need be completed.

_____ (Signed) _____ (Title)

Please return all sections of this report to: _____

Additional forms may be obtained from the above address.

NOTE: Please read reverse side of this page. Use additional sheets if necessary. Retain last copy.

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ENVIRONMENTAL PROTECTION AGENCY
AIR POLLUTANT EMISSIONS REPORT

FORM APPROVED
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SECTION IV - PROCESS/OPERATIONS EMISSIONS

HYDROCARBON EMISSIONS ONLY

Plant, institution, or establishment name: Hoover Company - Main Plant

Normal operating schedule: 16 Hours per day 5 Days per week 50 Weeks per year 3840 Hours per year.

Seasonal and/or peak operation period: None

Dates of annually occurring shutdowns of operations: 2nd & 3rd weeks of July. Additional operating information enclosed ☐.

Source Code[a]	Processes or Operations Releasing Pollutants to the Atmosphere[b,c,d]	Date Installation Went on Line	Raw Materials[e] Used for Processes or Operations				Products[g] of Processes or Operations				Intermittent Operation Only: Average Hours/week[h]	Future Increase or Decrease in Process Rate
			Type	Quantity			Type	Quantity				
				Annual Average[f]	Hourly Process Rate, lbs.			Annual Average[f]	Hourly Process Rate, lbs.			
					Design	Maximum			Design	Maximum		
R005	Spray Booth	1969	Fire Retard Paint	4,000 lb.	N/A	N/A	Plastic Parts	560,000 pcs.	N/A	N/A	40	
R010	Spray Booth	1969	"		N/A	N/A	Plastic Parts		N/A	N/A	40	

a. List a separate code number to represent each source (e.g., IV-a, IV-b, IV-c, etc.) then enter required data on this page and for the same code number sources in Sections V and VI.
b. Multiple sources may be grouped if similar in size and type.
c. Sulfuric acid-contact; aluminum smelting-crucible furnace; cement manufacturing-dry process; etc. (See instruction for examples and use appropriate identification numbers; other non-listed processes and operations, specify.)
d. The pollutants to be covered in this report are listed in the accompanying instructions.
e. Sulfur burned; pig, foundry returns, or scrap aluminum melted; limestone, cement rock, clay, iron ore used; etc.
f. Pounds, tons, gallons, barrels, etc.
g. Sulfuric acid produced; aluminum ingots produced, cement produced; etc.
h. For intermittent processes, indicate average number of hours per week of operation so that estimates of yearly emissions may be obtained.
j. Estimated percent increase or decrease in process rate on a total plant basis for the five years after the calendar year for which this report is completed. If increase is due to new equipment, please list this equipment separately.

N/A - Not available or not applicable.

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			Type	Quantity			Type	Annual Average[f]	Quantity			
				Annual Average[f]	Hourly Process Rate, lbs.				Hourly Process Rate, lbs.			
					Design	Maximum			Design	Maximum		
P001	Degreaser (Sol. Clnr)	1945	Per-chlor		N/A	N/A	Metal Parts	N/A	N/A	N/A	50	
P004	"	1964	"	200,000	N/A	N/A	Metal Parts	N/A	N/A	N/A	50	
E9 A-B	"	1976	"		N/A	N/A	Metal Parts	N/A	N/A	N/A	50	
P026	Impreg-nator	1969	Poly. Resin	3,000 gal.	N/A	N/A	Motor Parts	2.6 mil. pieces	N/A	N/A		
P028	Cure Oven	1967	Epoxy Resin	30,000 lb.	N/A	N/A	Motor Parts	1.5 mil. pieces	N/A	N/A		

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			Type	Quantity			Type	Annual Average[f]	Quantity			
				Annual Average[f]	Hourly Process Rate, lbs.				Hourly Process Rate, lbs.			
					Design	Maximum			Design	Maximum		
P029	Lacquer Tape Assem	1969	Lac-quer	3,600 gal.	N/A	N/A	Motor Parts	1.5 mil. pcs.	N/A	N/A		
P030	Field Bake Oven	1969	Var-nish	4,500 gal.	N/A	N/A	Motor Parts	1.2 mil. pcs.	N/A	N/A		
P031	Paint Mixing	1963	Paint & Sol	61,000 gal.	N/A	N/A	Metal Parts	N/A	N/A	N/A		
P027	Spray Paint System	1969	"	61,000 gal.	N/A	N/A	Metal Parts	N/A	N/A	N/A	60	
R004	Spray Paint	1969	Paint	40 gal.	N/A	N/A	Metal Parts	N/A	N/A	N/A	20	

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SECTION VI - STACK AND POLLUTANT EMISSIONS DATA

HYDROCARBON EMISSIONS ONLY

Plant, institution, or establishment name: Hoover Company - Main Plant

STACK DATA							ESTIMATE OF POLLUTANT EMISSIONS[e]			
Source Code[a]	Height Above Grade ft.	Inside Diameter at Top, ft.	Exit Gas Velocity,[b] ft./sec.	Exit Gas Temperature,[b] °F	Exit Gas Flow Rate, CFM[c]		Pollutant[d]	Quantity		
								Tons Per Year	Lbs. Per Hour	
					Average	Maximum			Average	Maximum
P001	48	4.75 x 3	31	80	26,444	26,444	Perchloroethylene	100	N/A	3.23*
P004	40	1.1	80	84	4,200	4,200	"		N/A	63.4*
B9A-13	50	1.0	51	80	2,322	2,322	"		N/A	15.0
P026	57	.8	23.4	163	550	550	Styrene	1.0	N/A	0.53*
P028	58	.75	11	230	237	237	Hydrocarbon	1.0	N/A	0.48*
P029	54	1.2	15	80	977	977	Lacquer Thinner	1.0	N/A	0.35*
P030	56	1.8	31	174	4,650	4,650	Varnish Solvents	34.5	N/A	17.26**

a. List code numbers corresponding to each emissions source reported in Sections II, III, and IV.

b. Values should be representative of average flow conditions for hours of operation.

c. At actual flow conditions.

d. The pollutants to be covered in this survey are specified in the accompanying instructions.

e. Give stack test data if available (indicate stack sampling method used), otherwise, specify basis used. If unknown, please do not complete these columns.

N/A - Not available

* - Zurn Environmental Engineers - Scott Model 116 Total Hydrocarbon Analyzer

** - Monsanto Research Corp.

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ENVIRONMENTAL PROTECTION AGENCY
AIR POLLUTANT EMISSIONS REPORT

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SECTION VI - STACK AND POLLUTANT EMISSIONS DATA

HYDROCARBON EMISSIONS ONLY

Plant, institution, or establishment name: Hoover Company - Main Plant

STACK DATA							ESTIMATE OF POLLUTANT EMISSIONS[e]			
Source Code[a]	Height Above Grade ft.	Inside Diameter at Top, ft.	Exit Gas Velocity,[b] ft./sec.	Exit Gas Temperature,[b] °F	Exit Gas Flow Rate, CFM[c]		Pollutant[d]	Quantity		
								Tons Per Year	Lbs. Per Hour	
					Average	Maximum			Average	Maximum
P031	57	1.8	19	80	2,560	2,560	Paint Solvents	4	N/A	2.21*
P027	57	3.5, 3.5, 1.5	35	80	26,566	26,566	Paint Solvents	150	N/A	186.9*
P027	57	3.2, 3.5, 3.5	30	80	28,430	28,430	Paint Solvents	180	N/A	160*
P027	57	1.8 x 2.2	20.46	337	2,555	2,555	Paint Solvents	9	N/A	9.0**
R004	59	.75	16.6	70	544	544	Paint Solvents	.2	N/A	.4*
R005	58	1.5	18.8	85	3,300	3,300	Paint Solvents	.5	N/A	1.4*
R010	62	2.0	27	90	5,091	5,091	Paint Solvents	.5	N/A	3*

a. List code numbers corresponding to each emissions source reported in Sections II, III, and IV.

b. Values should be representative of average flow conditions for hours of operation.

c. At actual flow conditions.

d. The pollutants to be covered in this survey are specified in the accompanying instructions.

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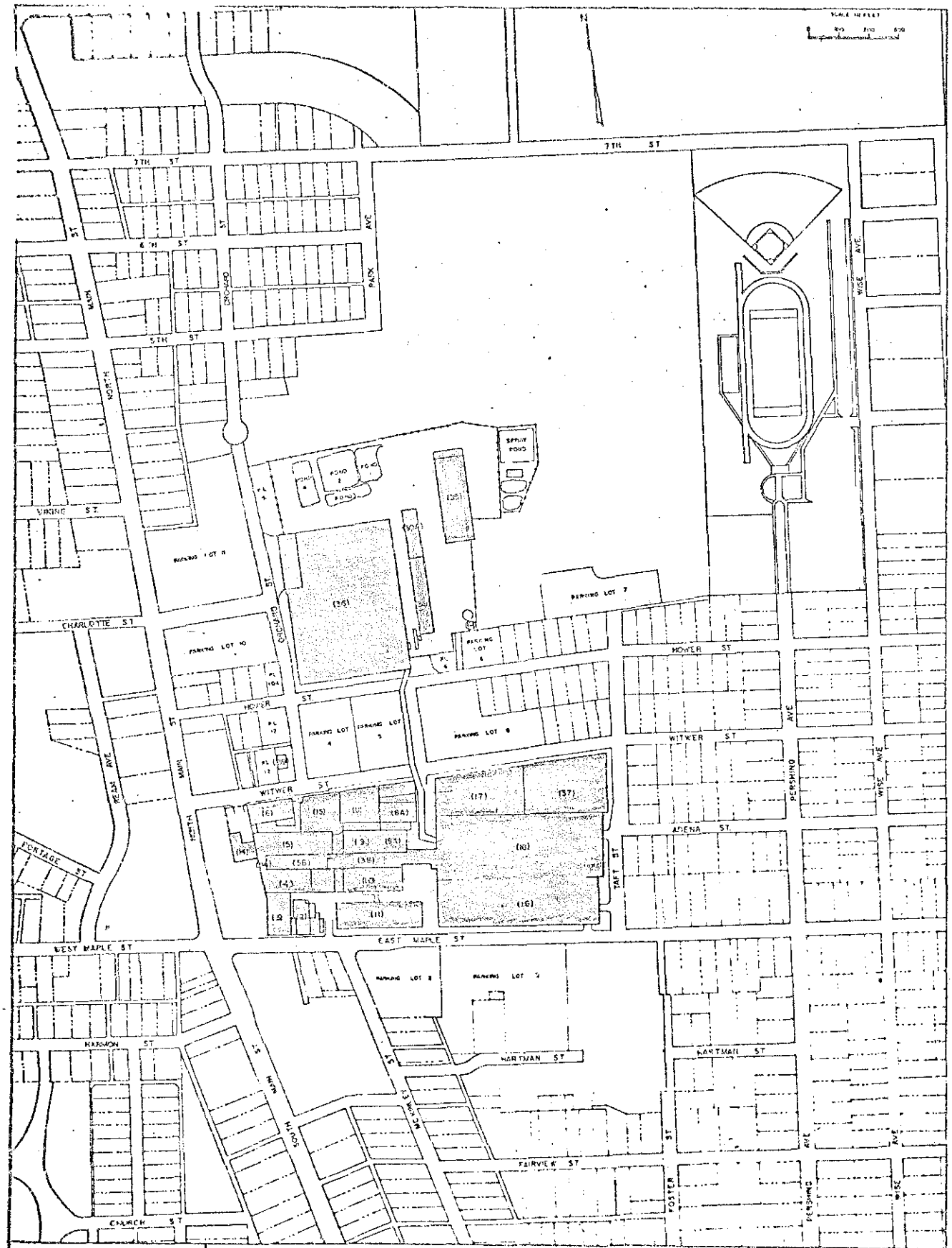
EXHIBIT A



THE HOOVER COMPANY
NORTH CANTON, OHIO
PLANT SITE MAP

SUBJECT _____
DATE _____
BY _____
SCALE 1" = 100' by [illegible]

EXHIBIT XXX

EXHIBIT B

CHEMICAL COMPOSITION

Source Code	Chemical	% Total
P001	Perchloroethylene	100
P004	Perchloroethylene	100
B9A-13	Perchloroethylene	100
P026	Styrene (not analyzed) less than 15 lb/day	
P028	Unknown Hydrocarbons (not analyzed) less than 15 lb/day	
P029	Lacquer Solvent (not analyzed) less than 15 lb/day	
P030	(Oven Emission - Monsanto Analysis)	
	Isobutanol	21
	*Ethyl Cellosolve	64
	Toluene	2.8
	Xylene	7.1
	Sat Hydrocarbons (Aliphatic)	3.5
	*Also called ethylene glycol monethyl ether or 2 ethoxy ethanol.	
P031 & P027	(Booth Emission - Paint Solvent Formulation)	
	Hi Flash Naptha	42.80
	Butanol	18.46
	Cellosolve Acetate	18.26
	Butyl Acetate	11.80
	Toluol	5.34
	Mineral Spirits	2.23
	Isopropyl Alcohol	1.11
R004	Butyl Cellosolve	4.8
	Cellosolve Solvents	3.7
	Rule 66 Mineral Spirits	4.4
	Metylisobutyl Carbinol	8.0
	Ethanol	.7
	VM & P Naptha	68.6
	Isopropyl Alcohol	9.6
	Zamino Methyl Propanol	.1

Source Code	Chemical	% Total
P027	(Oven Emission - Monsanto Analysis)	
	Acetaldehyde	3.7
	Ethanol	6.3
	Acetone	3.7
	Isopropanol	.3
	n - Propanol	.9
	Methyl-Ethyl Ketone	6.3
	n - Butanol	61
	2 Methyl Butanol	1.3
	Toluene	2.5
	Butyl Acetate	10
	Xylene	3.2
R005 & R010	(Booth Emissions - Paint Solvent Formulation)	
	Butyl Cellosolve Acetate	12
	Cyclohezanone	3.8
	Amsco 2460 T	17.8
	NBK	16.6
	Isopropyl Alcohol	7.2
	1800 HF	10.5
	Butyl Acetate	22.9
	Butanol	8.8

EXHIBIT C

HOOVER COMPLIANCE STATEMENT

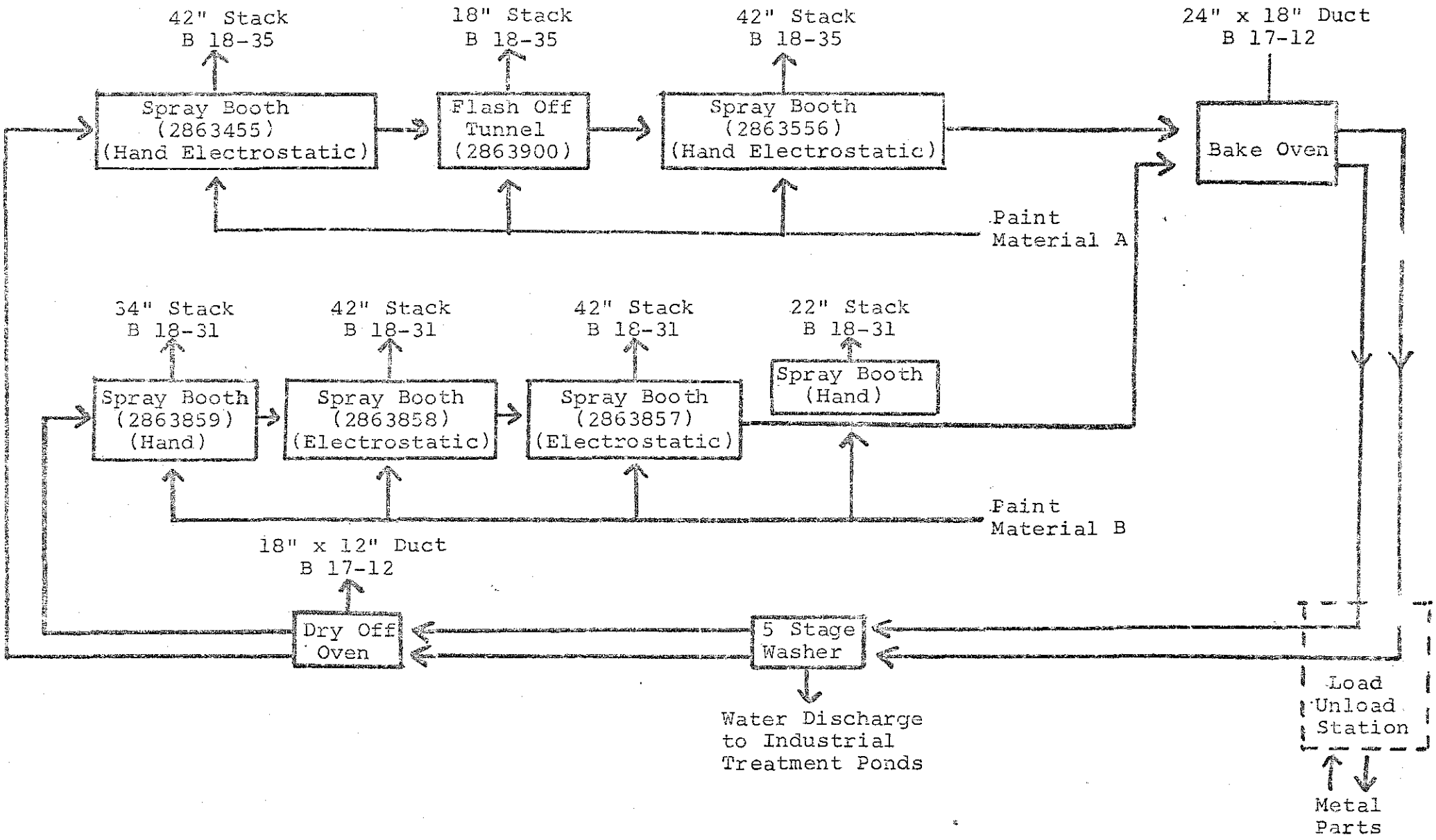
The twelve (12) emission sources at the Hoover Main Plant are in compliance with Section AP-5, the Ohio Regulations for Hydrocarbons. The following sources are noted and the reason for compliance.

SOURCE	REASON FOR COMPLIANCE
P001, P004 B9A-13	Three solvent cleaning devices using perchlorothylene, a non-photochemically reactive classified solvent.
P026, P029 P028, R004	Emission is less than 15 lb/day for each of these four sources. (Miscellaneous plastic coating and paint mixing.)
P030, P027	The oven emissions from these two sources were analyzed by Monsanto Labs and the hydrocarbon content was determined to be non-photochemically reactive. The spray booths emissions from source P027 are non-photochemically reactive.
R005 & R010	Two paint booths which apply air drying paints which have non-photochemically reactive solvent systems.

EXHIBIT D

Flow Diagram For Sources P027 and P030.

PROCESS FLOW DIAGRAM - P027

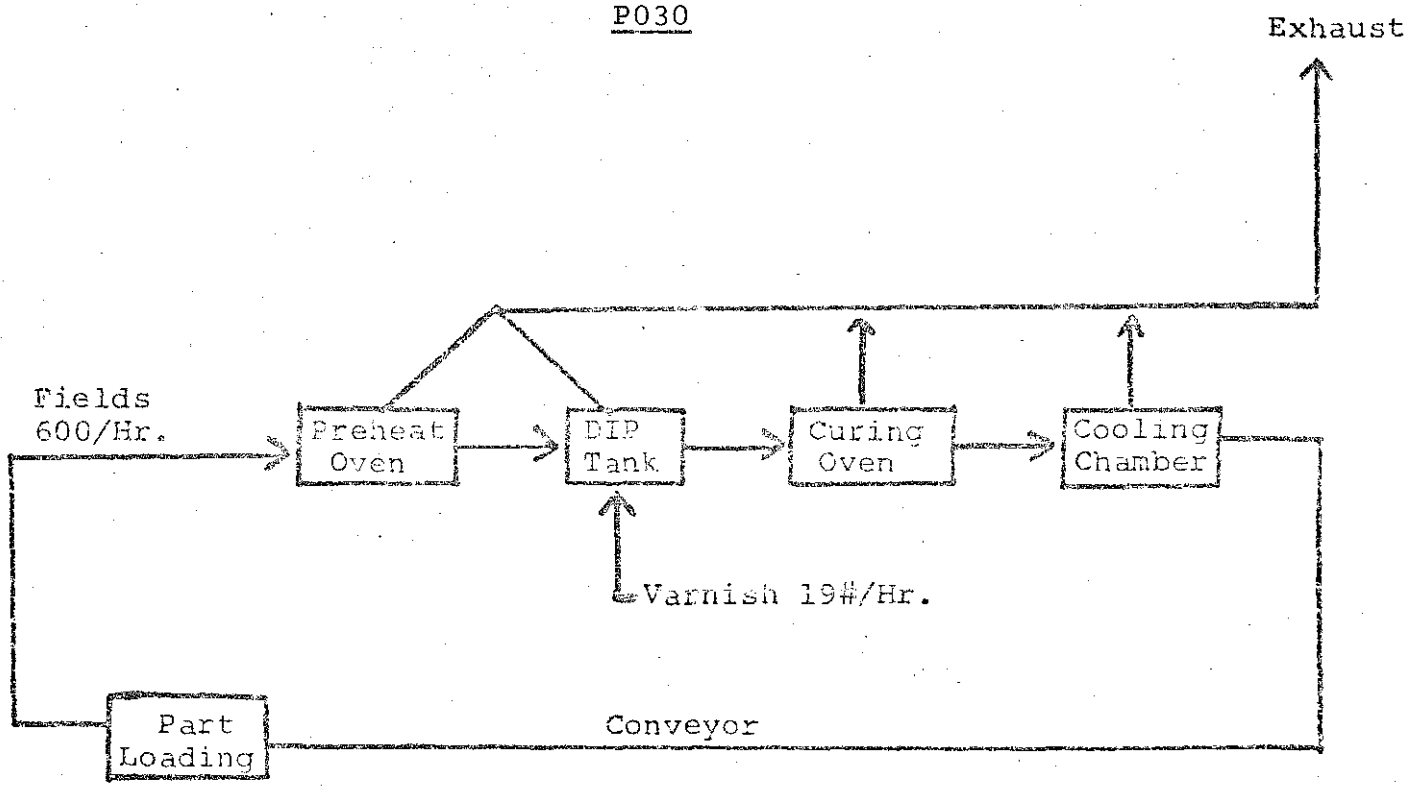


PROCESS FLOW DIAGRAM

AND

VARNISH COMPOSITION

P030



VARNISH COMPOSITION

Varnish 38.7% Solids

Varnish Wt. 7.07 Lb./Gal.

Specific Gravity of Solvent 0.838

Solvent Composition:

50.7% Amsco 66-3 Mineral Spirits

33.7% Ethylene Glycol Ethyl Ether (Cellosolve)

9.3% Isbutanol

5.3% Aromatic Hydro Carbons

EXHIBIT E

PREFACE

This is a report of the results of sampling done on 27 August 1973 at the Hoover plant in Canton, Ohio. Sampling was conducted on the paint dryer oven and field oven exhausts. Both sites were sampled to determine the quantities of photochemically reactive materials in the effluent. Test results, field data, and calculations are given.

SUMMARY OF DATA

Table 2 lists the summary of stack conditions and emission data. The emission data is given both in terms of total organic emissions and the photochemical emissions. The compounds listed in Tables 1 and 2 were the only materials found at a significant level. The limit of detection is estimated to be below 1×10^{-9} lb/SCF. Of the compounds detected, xylene and toluene can be classified as photochemically reactive. These materials comprise 5.8% of the emissions from the paint dryer and 10% from the field oven.

TABLE 1

PAINT SPRAYER

Component	mg Collected	$lb/ft^3 \times 10^{-6}$	lb/hr
Acetaldehyde	.06	2.24	.34
Ethanol	.10	3.74	.57
Acetone	.06	2.24	.34
Isopropanol	.006	.224	.03
n - Propanol	.016	.598	.09
Methyl-Ethyl Ketone	.10	3.74	.57
n - Butanol	.96	35.9	5.51
2 Methyl Butanol	.02	.747	.12
Toluene*	.04	1.49	.23
Butyl Acetate	.16	5.98	.92
Xylene*	.05	1.87	.29

* Photochemical reactive compound

Grab Sample	Time Sample was Taken	Total Hydrocarbons Expressed as CH_4 Equivalents (ppm)
1	0841	261
2	0927	205

TABLE 2

FIELD OVEN

Component	mg	$lb/ft^3 \times 10^{-6}$	lb/hr
Isobutanol	.3	14.7	3.7
Ethyl Cellosolve (1)	.9	44.1	11.2
Toluene (2)	.04	1.95	.50
Xylene (2)	.1	4.9	1.24
Sat Hydrocarbons (Aliphatic)	.05	2.45	.62

Grab Sample	Time Sample was Taken	Total Hydrocarbons Expressed as CH_4 Equivalents (ppm)
3	1455	339
4	1510	170

(1) Also called ethylene glycol monoethyl ether or 2 ethoxy ethanol

(2) Photochemical reactive compound

TABLE 3

DATA SUMMARY SHEET

	Paint Sprayer	Field Oven
Area $(ft)^2$	3.5	2.64
Average Temperature (°F)	337	154.5
Absolute Barometric Pressure (In Hg)	28.92	28.92
Absolute Stack Pressure (In Hg)	28.92	28.92
Percent Moisture (%)	7.46	2.8
Molecular Weight of Stack Gas (lbs/lb-mole)	28.02	28.5
Avg. of Sq. Rt. of ΔP $(In\ H_2O)^{\frac{1}{2}}$	.284	.526
Stack Gas Velocity (ft/sec)	20.46	33
Volumetric Flow Rate (DSCFM)	2555	4240
Volumetric Flow Rate (DSCFH)	153300	254400
Total Organic Emission Rate (lbs/hr)	9.01	17.26
Photochemical Emission Rate (lbs/hr)	.52	1.74
Percent Photochemical	5.8	10.1
Percent of Total Emission		
Xylene (°up to 8% allowed)	3.2	7.2
Toluene (up to 20% allowed)	2.6	2.9